MODEL 60-NA

VOLT-OHM-MILLIAMMETER

TRIPLETT

INSTRUCTION MANUAL

MP MASTER
MA26257

SAFETY RULES

WARNING

This tester has been designed with your safety in mind. However, no design can completely protect against incorrect use. Electrical circuits can be dangerous and/or lethal when lack of caution or poor safety practices are used.

READ THE MANUAL

Read this Instruction Manual carefully and completely.

Voltages and currents within the capability of this test equipment can be hazardous. Follow the instructions in this manual for every measurement. Read and understand the general instructions before attempting to use this tester. Do not exceed the limits of the tester.

SAFETY CHECK

Double check the switch setting and lead connections before making measurements. Are you following all of the instructions?

Disconnect the tester or turn off the power before changing switch positions.

Do not connect to circuits with voltage present when switch is in any ohms or current position.

When replacing fuses use only specified type fuses and insert in correct fuse holder.

DON'T TOUCH

Don't touch exposed wiring, connections or other "live" parts of an electrical circuit. If in doubt, check the circuit first for voltage before touching it.

Turn off the power to a circuit before connecting test

probes to it. Be sure there is no voltage present before you touch the circuit.

Do not use cracked or broken test leads.

HIGH VOLTAGE IS DANGEROUS

Always start with the power off. Be sure there is no voltage present before making connections to the circuit.

Don't touch the tester, its test leads, or any part of the circuit while it is on.

Before disconnecting the tester, turn the circuit off and wait for the meter to return to "zero."

DISTRIBUTION CIRCUITS PACK A PUNCH

In high energy circuits such as distribution transformers and bus bars, dangerous arcs of explosive nature can occur if the circuit is shorted. If the tester is connected across a high energy circuit when set to a low resistance range, a current range, or any other low impedance range, the circuit is virtually shorted.

Special equipment designed for use with these circuits is available. Contact a qualified person for assistance before attempting to make measurements on any high energy circuit.

SAFETY IS NO ACCIDENT

TRIPLETT MODEL 60-NA
VOLT - OHM - MILLIAMMETER
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SPECIFICATIONS

RANGES:

DC VOLTAGE

VOM 0-0.15, 0.5, 1.5, 5, 15, 50, 150, 500 volts at approx. 20,000 Ω/v

x2 0-0.3, 1, 3, 10, 30, 100, 300, 1000 volts at approx. 10,000 Ω/v

AC VOLTAGE

VOM 0-3, 15, 50, 150, 500 volts at approx. 10,000 Ω/v

x2 0-6, 30, 100, 300, 1000 volts at approx. 5,000 Ω/v

DC CURRENT

VOM 0-0.05, 0.5, 5, 50, 500 mA at approx. 150 mV

x2 0-0.1, 1, 10, 100, 1000 mA at approx. 300 mV

RESISTANCE

0-1k, 10k, 100k, 1 Meg, 10 Meg, 100 Meg
(6, 60, 600, 6k, 60k, 600k ohms center scale)

DECIBELS

-20 dB to +52 dB

AC CURRENT RANGES WITH MODEL 10-C ADAPTER

6, 12, 30, 60, 120, 300 AC Amps

OHMMETER SPECIFICATIONS

	Maximum Values					
Range	X1	X10	X100	X1k	X10k	X100k
Voltage-Volts	1.7	1.7	1.7	1.7	34	34
Current-mA	282	28.2	2.82	0.282	0.566	0.0566
Power Transfer To Load-mW	120	12	1.2	0.12	4.81	0.481

ACCURACY (Calibrated at 77° F):

DC Voltage	± 1.5% of full scale value
DC Current	± 1.5% of full scale value
AC Voltage	± 3% of full scale value
Resistance	± 1.5% of arc length

FREQUENCY RESPONSE:
ACV through 300 are compensated from 20 Hz to 20 kHz.

METER:
Suspension. Separate housing for easy replacement.

SCALE:
4.5" long. AC and DC use same double scales with exception of 3 and 6 volt AC. Mirror used to eliminate parallax.

TEST LEADS:
One red and one black lead supplied, each 48 inches long.

CARRYING HANDLE:
Position indent provides inclined tester stand.

OVERLOAD PROTECTION:
Meter movement protected by a diode module.
1/8 Amp/250V Fuse (Littelfuse 362.125 8AG).
1 Amp/250V Fuse (Bussmann ABC-1 or Littelfuse 314001 3AB).
2 Amp/1000V Fuse is located inside tester. Replace with Bussmann HVA-2 or Littelfuse 621002.

BATTERIES:
One 1.5 Volt "D" cell (NEDA 13F).
One 30 Volt battery (NEDA 210).

WEIGHT:
Approximately 2 1/2 pounds.

SIZE:
Approximately 3 1/4" x 5 1/4" x 7 1/4".

DESCRIPTION

The Triplett Model 60-NA Volt-Ohm-Milliammeter (VOM) is a multi-range instrument for general electrical and electronic trouble shooting and measurement. It has been especially designed to satisfy the need for a precision instrument which can stand up under rigorous hard usage of the industrial and maintenance environment and at the same time provide a degree of safety in its use heretofore unavailable with an instrument of this kind.

DROP PROOF:

Unique design and selection of materials permits the instrument to withstand the normal accidents of dropping and rough handling which occur in hard day to day use. The Model 60-NA is warranted to withstand an accidental drop up to a five foot height with deviation from its stated accuracy not exceeding ± 4%. The warranty does not include mechanical parts being defaced (scratched, etc.) from a drop or normal usage.

BURNOUT PROOF:

The instrument has been engineered for significant reduction in the need for maintenance by virtual elimination of parts burn out (other than fuses), and parts damage from severe mechanical abuse. Three fuses are employed for unusual protection to the instrument and safety for the user. The 1/8 Amp and 1 Amp instrument fuses are used for normal overload conditions. Spares for each are included in the instrument. Protection is provided for high energy fault currents beyond the capabilities of the instrument fuses up to the capacity of the 2 Amp/1000V (20 kW) fuse.

SUPER SAFE:

Unusual effort has gone into this instrument's design to provide the greatest possible safety to the user.

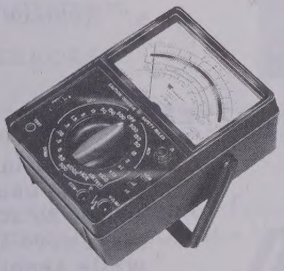
The Model 60-NA provides a specially engineered internal electrical system to prevent explosive arcs in high energy circuits up to the 2 Amp/1000V (20 kW) fuse capacity. Complete insulation of the instrument itself plus a new type test lead are additional safety features.

CONFIDENCE TEST:

A feature built into the instrument for periodic reassurance checks of its meter. While not intended as a comprehensive test of the instrument it does permit a high level of confidence in the instrument meter if the pointer indicates within the area of the test symbol.

Ranges have been designed to cover nearly all applications with the added convenience of signal level measurements in decibel decade steps.

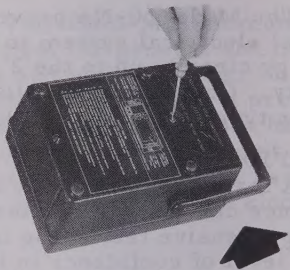
The carrying handle can be rotated to provide a stand for placing the instrument at a viewing angle of approximately 30 degrees.



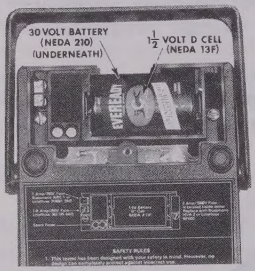
A separately sealed battery compartment permits access to batteries and fuses without removal of the remainder of the instrument. In addition, battery acids are sealed off to prevent damage to components.

GENERAL INSTRUCTIONS

INSTALL BATTERIES:

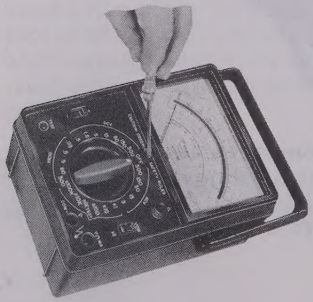


1. Loosen captive screw.
2. Slide cover off.
3. Install batteries.



4. Replace cover.

ADJUST POINTER TO ZERO:



With unit in operating position use a screwdriver to adjust pointer for a zero indication. While keeping the pointer on zero, reverse the rotation of the screw slightly to disengage it. This will reduce the affect of pointer shift under shock.

START WITH HIGHEST RANGE

When the approximate value of the voltage or current being measured is not known, always start with the highest range to avoid overload and blowing a fuse.

RANGE CHOICE

For greatest accuracy choose the range which allows readings to be made in the upper (right hand) portion of the scale. Accuracies are rated as percent of full scale so the closer to full scale the better the accuracy.

DO NOT CHANGE SWITCHES UNDER LOAD

Quality switches are used but any switch will arc if changed while under load. Disconnect the test probes or shut off the circuit under test before the range switch, polarity switch, or multiplier (x2) switch positions are changed. This practice will result in increased life and reliability of the instrument.

MEASUREMENT ERRORS

Readings on the sensitive ranges may sometimes be different than expected due to thermoelectric or electrochemical effects.

Readings on the high resistance ranges can be affected by touching the circuit causing the body to act as a shunting resistor.

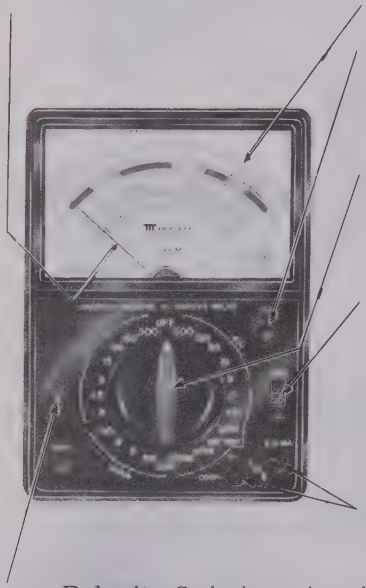
Consideration should be given to the loading affect of the instrument when measuring voltages from sources of high impedance.

SWITCH CONTACTS

When an instrument has not been used for a long period of time operate all switches several times to wipe the contacts.

USE OF CONTROLS

Pointer



Scales - See Page 11.

Ohms Adjust Control - sets full scale (0 ohms) indication on ohms ranges with test leads shorted.

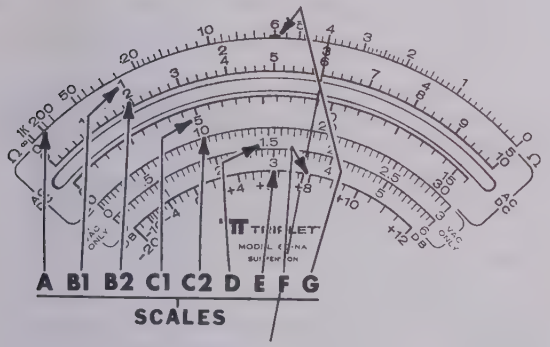
Range Switch - should be placed in OFF position when unit is not in use for best meter protection.

Multiplier (x2) Switch - when in the "VOM" position the range is the same as indicated by the range switch. When in the "x2" position the range is twice that indicated by the range switch.

Panel Jacks - plug black test lead into "COM-" jack and red test lead into "V-Ω-mA" jack.

Polarity Switch - when in the "+" position a positive voltage applied to the "V-Ω-mA" jack will cause an upscale pointer deflection. When in the "-" position the polarity is reversed.

GENERAL INSTRUCTIONS (cont'd.)
USE OF SCALES



Range Switch Position	Mult. Switch Position	Read Scale	Reading For Above Indication
500DCV	x2	B2	600VDC
500DCV	VOM	B1	300VDC
150DCV	x2	C2	190VDC
150DCV	VOM	C1	95VDC
50DCV	x2	B2	60VDC
50DCV	VOM	B1	30VDC
15DCV	x2	C2	19VDC
15DCV	VOM	C1	9.5VDC
5DCV	x2	B2	6VDC
5DCV	VOM	B1	3VDC
1.5DCV	x2	C2	1.9VDC
1.5DCV	VOM	C1	0.95VDC
0.5DCV	x2	B2	0.6VDC
0.5DCV	VOM	B1	0.3VDC
0.05mA	x2	B2	.18VDC
0.05mA	VOM	B1	.09VDC
500mA	x2	B2	600mADC
500mA	VOM	B1	300mADC
50mA	x2	B2	60mADC
50mA	VOM	B1	30mADC
5mA	x2	B2	6mADC
5mA	VOM	B1	3mADC
0.5mA	x2	B2	0.6mADC
0.5mA	VOM	B1	0.3mADC
0.05mA	x2	B2	0.06mADC
0.05mA	VOM	B1	0.03mADC

Range Switch Position	Mult. Switch Position	Read Scale	Reading For Above Indication
X100k	VOM	A	400kΩ
X10k	VOM	A	40kΩ
X1k	VOM	A	4kΩ
X100	VOM	A	400Ω
X10	VOM	A	40Ω
X1	VOM	A	4Ω
500ACV	x2	B2	600VAC
500ACV	VOM	B1	300VAC
150ACV	x2	C2	190VAC
150ACV	x2	F	47.8dB
150ACV	VOM	C1	95VAC
150ACV	VOM	F	41.8dB
50ACV	x2	B2	60VAC
50ACV	x2	F	37.8dB
50ACV	VOM	B1	30VAC
50ACV	VOM	F	31.8dB
15ACV	x2	C2	19VAC
15ACV	x2	F	27.8dB
15ACV	VOM	C1	9.5VAC
15ACV	VOM	F	21.8dB
3ACV	x2	E	3.6VAC
3ACV	x2	F	13.8dB
3ACV	VOM	D	1.83VAC
3ACV	VOM	F	7.8dB
Test Function			
x1k Test	VOM	G	Out of Tolerance

MEASURING RESISTANCE

0 TO 100 MEGOHMS (X1 THRU X100k):

1. Place the multiplier switch in the "VOM" position.
2. Set range selector switch to desired (Ω) range.
3. Plug the test leads into the jacks. Short test prods and adjust the "Ω" control to set the pointer over the right (0 ohms) end of the red "Ω" scale.
4. Turn off all power to the circuit to be measured and/or disconnect one end of component being checked. Connect test leads across the circuit or part. OBSERVE ALL SAFETY PRECAUTIONS.
5. Read resistance on the "Ω" scale. Multiply the indication by the range multiplier (e.g. - multiply by 10 on the X10 range, 10,000 on the 10k range).

CONTINUITY TESTING:

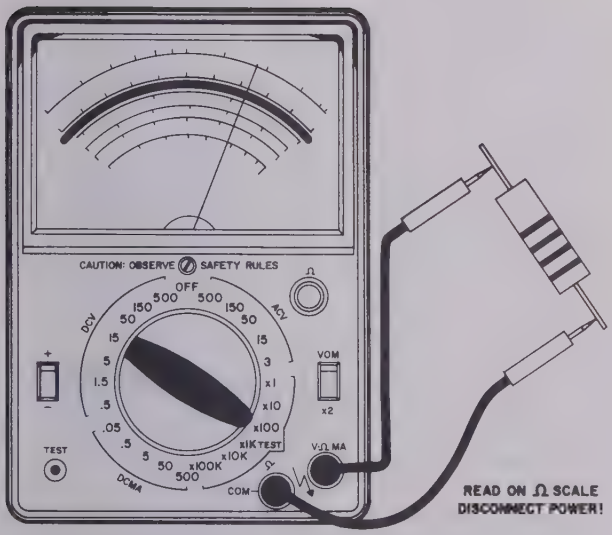
Use the X1k resistance range. The lower battery drain will give longer battery life.

CAUTION:

Some semiconductor devices can be damaged by the voltage and current available in the ohmmeter circuit. Compare ratings of semiconductor devices and ohmmeter specifications (page 4) before making measurements.

POLARITY SWITCH:

The polarity switch reverses the polarity of the jacks. This feature can be used for checking semiconductors. The V-Ω-mA jack is connected to the positive battery terminal with the polarity switch in the "+" position.



Measuring Resistance

MEASURING DC VOLTS

0-0.5 THRU 0-1000 DC VOLTS:

1. Select the desired DC voltage (DCV) range with the range selector switch, and the multiplier switch.

2. Check the setting of the polarity switch for proper polarity.

3. Plug the test leads into the jacks.

4. Connect the test leads across the circuit to be measured. OBSERVE ALL SAFETY PRECAUTIONS.

5. Read DC voltage on the appropriate black "AC-DC" scale.

0-0.15, 0.30 DC VOLTS:

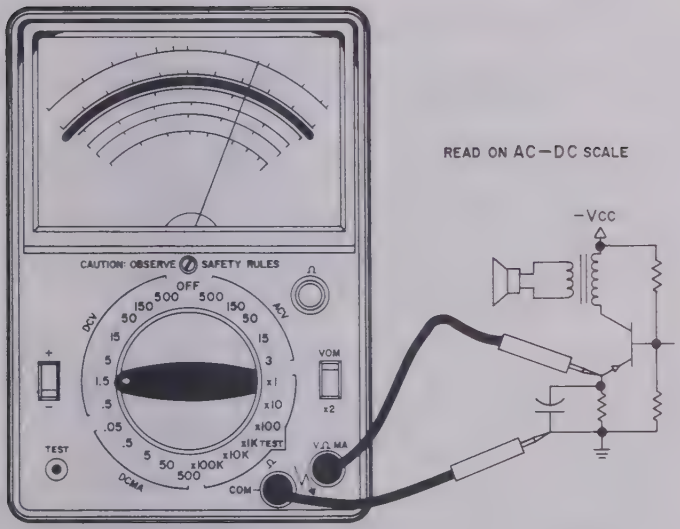
1. Set the range selector switch to 0.05 DCmA, and the multiplier switch to the "VOM" position for 0.15V and to the "x2" position for 0.30V.

2. Check the setting of the polarity switch for proper polarity.

3. Plug the test leads into the jacks.

4. Connect the test leads across the circuit to be measured. OBSERVE ALL SAFETY PRECAUTIONS.

5. Read DC voltage on the black 0-5 and 0-10 AC-DC scales. Multiply indication by 30 for 150 mV (.15V) and 300 mV (.3V).



Measuring DC Volts

MEASURING AC VOLTS

0-3 THRU 0-1000 AC VOLTS:

1. Select the desired AC voltage (ACV) range with the range selector switch, and the multiplier switch.
2. Plug the test leads into the jacks.
3. Connect the test leads across the circuit to be measured. OBSERVE ALL SAFETY PRECAUTIONS.
4. Read AC voltage on the appropriate scale. For 15 and 150 volts, 30 and 300 volts, 50 and 500 volts, and 100 and 1000 volts use the corresponding 0-15, 0-30, 0-5, and 0-10 black "AC-DC" scales, respectively. For 6 and 3 VAC use the red 0-6 and 0-3 "AC only" scales, respectively.

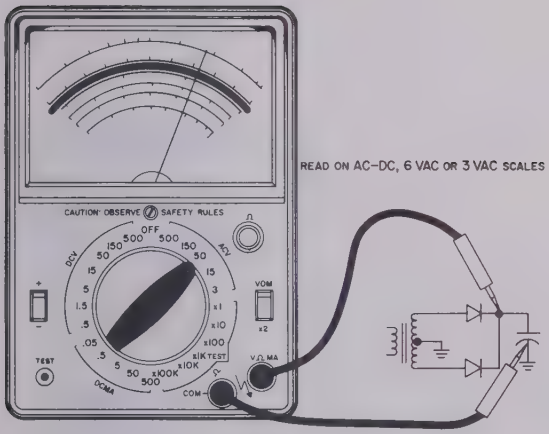
MEASURING OUTPUT VOLTAGE

If there is a DC component to the voltage to be measured and only the value of the AC component is desired, a capacitor may be placed in series with the test lead to block the DC voltage. The remaining AC voltage is known as "output voltage".

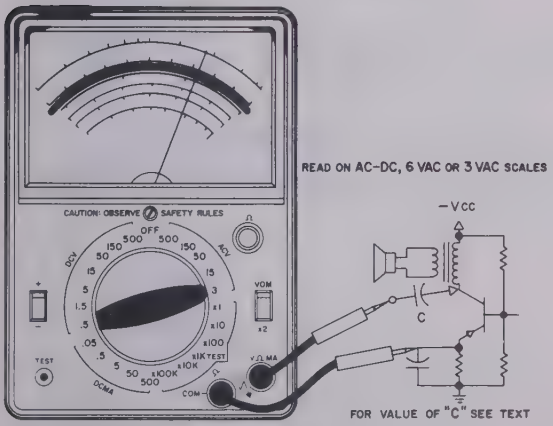
For general audio frequency measurements, use a .22 μF capacitor. For low frequency measurements or for measurements on the 3 AC volt range, use a 1.0 μF or larger capacitor. Capacitor working voltage should be higher than the sum of DC voltage and peak value of the AC voltage. In general a 600 volt capacitor is sufficient.

0-3 THRU 0-300 AC VOLTS:

1. Connect a capacitor to the point in the circuit to be measured. See note above for value and volt rating.
2. Same as steps 1 thru 4 for AC VOLTS (above).



Measuring AC Volts



Measuring Output Voltage

MEASURING DC CURRENT

0-0.05 THRU 0-1000 DC MILLIAMPERES:

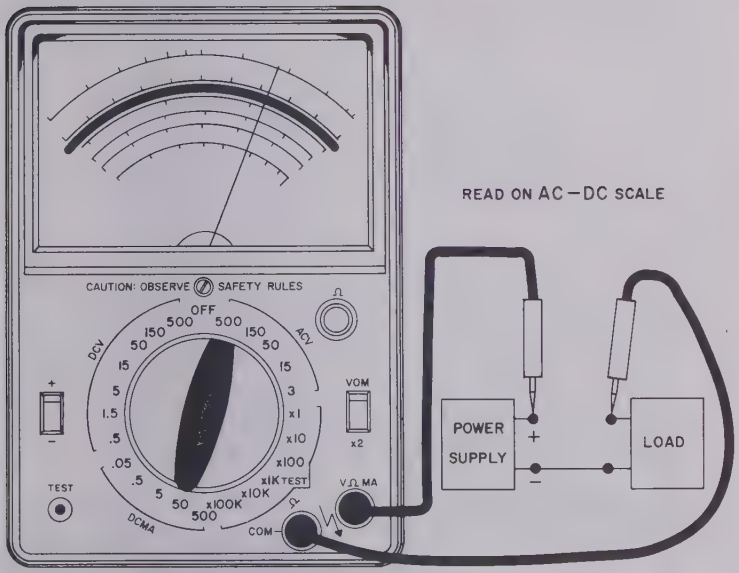
1. Select the desired DC current (DCmA) range with the range selector switch, and the multiplier switch.

2. Check the setting of the polarity switch for proper polarity.

3. Plug the test leads into the jacks.

4. Connect the test leads in series with the circuit to be measured. OBSERVE ALL SAFETY PRECAUTIONS.

5. Read DC current on the black 0-5 or 0-10 "AC-DC" scale when the multiplier (x2) switch is in the "VOM" or "x2" position respectively.



Measuring DC Current

MEASURING AC CURRENT WITH MODEL 10-C ADAPTER

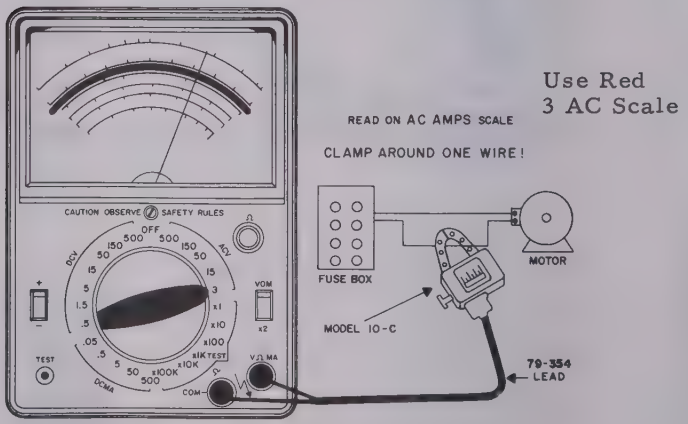
When a single conductor is available with up to 300 amperes of current, set up tester as follows:

1. Connect a Triplett Model 10-C AC Ammeter Adapter to the Model 60-NA panel jacks using 79-354 lead assembly.

2. Set the Model 60-NA selector switch to 3 ACV and the multiplier switch to the "VOM" position.

3. Set the switch on the Model 10-C to the 300 AC Amperes position.

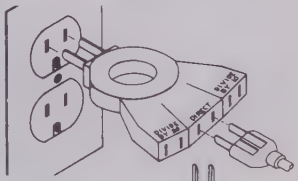
4. Press the plunger on the side of the Model 10-C to open the jaws, place the jaws around ONE conductor of the circuit to be measured and release the plunger. Locate conductor in center of jaws for best accuracy. Do not place the jaws of the Model 10-C around more than one wire. An incorrect reading will result. Observe all safety precautions.



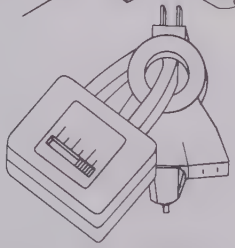
MEASURING AC CURRENT (cont'd.)

When a single conductor is not available a Model 101 line splitter can be used for currents up to 30 AC Amperes. The Model 101 can also be used for obtaining a greater current sensitivity than with the Model 10-C alone.

Steps 1 - 2. Same as for single conductor.



3. Plug the line cord of the apparatus to be tested into the "Direct" outlet of the Model 101 and plug the Model 101 into a wall outlet.



4. Set the Model 10-C range switch to the 30 AC Ampere position.

5. Place the jaws of the Model 10-C through the hole in the Model 101.

6. Adjust the Model 10-C range switch for maximum meter deflection. Do Not Use the 60, 120 or 300 Amp positions.

7. Read AC current on the red 3 "AC only" scale.

8. The sensitivity of the measurement can be increased 10 or 20 times by following the above procedure except plugging the line cord into the "Divide by 10" or "Divide by 20" outlet of the Model 101 in Step 3.

MEASURING DECIBELS (dB)

The decibel is a unit that expresses the ratio of power levels. It is mathematically derived to reduce multiplication and division to addition and subtraction, respectively, (e.g.- 10 dB represents multiplication by 10, 20 dB by 100, 30 dB by 1000). The decibel roughly approximates human hearing ratios. For this reason, it is commonly used in audio and telephone measurements.

Because the decibel represents a ratio, there is a reference level. The Model 60-NA reference level for 0 dB is 1 milliwatt into a 600 ohm load (.775 ACV across 600 ohms). Measurements made across loads other than 600 ohms are relative measurements.

To measure decibels, connect the Model 60-NA the same as for measuring AC voltage (or OUTPUT voltage, if there is DC voltage present). But, read the dB scale instead of the voltage scales. A chart on the dial shows the dB values to be added to the reading for the different voltage ranges. (e.g. - when the selector switch is set to the 15 VAC position, and the multiplier switch to the "VOM" position, add 14 dB to the indicated value). As explained above, addition of dB represents multiplication of power (or voltage).

CONFIDENCE-TEST

A "Confidence-Test" feature has been built into the instrument to allow the user to make periodic reassurance checks of the meter. To make the test proceed as follows:

1. Make mechanical adjustment by placing the tester in operating position, using a screwdriver to adjust pointer for a zero indication. While keeping the pointer on zero, reverse the rotation of the screw slightly to disengage it. Other information given in General Instructions on page 8.

2. Set range selector to RX1k ohms position.

3. Plug in test leads in appropriate jacks and short test tips together and adjust ohms control to full scale ohms zero.

4. Now take the red "+" test lead (w/o alligator clip) and touch it to the "test" contact on the front panel. The pointer should indicate in the area of the test symbol (red block), located at the midscale of the "Ω" scale at top of dial.

CALIBRATION

Should calibration be necessary voltage and current sources of .2% or better accuracy should be used and the sequence listed below should be followed.

1. MECHANICAL ZERO

   A. Adjust pointer to zero (see General Instructions page 8).

2. 50 MICRO-AMPERE CALIBRATION

   A. Set function switch to .5 DCV position.
   B. Set polarity switch to "+", and multiplier switch to "VOM" position.
   C. Connect test leads to a 50 μA source.
   D. Adjust R34 for full scale on the 0-5 scale.

3. DCmV CALIBRATION

   A. Set function switch to 0.05 DCmA position.
   B. Set polarity switch to "+", and multiplier switch to "VOM" position.
   C. Connect test leads to a 150 mV source.
   D. Adjust R35 for full scale 0-10 scale.

4. REPEAT STEPS 2 AND 3

   A. Re-adjust R34 and R35 if necessary to compensate for interaction of the two controls.

5. 3 AC VOLTS CALIBRATION

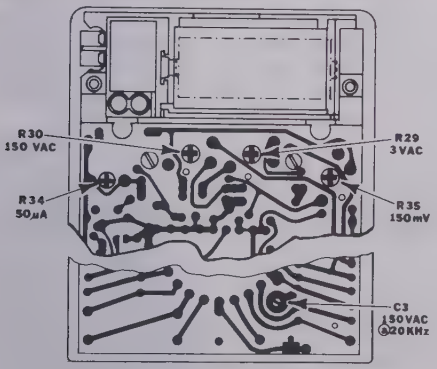
   A. Set function switch to 3 ACV range.
   B. Set polarity switch to "+", and multiplier switch to "VOM" position.
   C. Connect test leads to a 3 ACV source.
   D. Adjust R29 to full scale on the red 3 "AC only" scale.

6. 150 AC VOLTS CALIBRATION
   - A. Set function switch to 150 ACV range.
   - B. Set polarity switch to "+", and multiplier switch to "VOM" position.
   - C. Connect test leads to a 150 ACV source.
   - D. Adjust R30 to full scale on the 0-15 scale.

7. REPEAT STEPS 5 AND 6, IF NECESSARY

8. FREQ. RESPONSE CALIBRATION
   - A. Set function switch to 150 ACV position with the multiplier switch in "VOM" position.
   - B. Connect test leads to a 150 ACV, 20 kHz source, and adjust trimmer C3 (mounted on P.C. board) to full scale on the black 0-15 "AC-DC" scale.

9. CHECK ALL RANGES FOR ACCURACY
   - A. With appropriate voltage, current and ohms standards check all ranges.



Calibration Controls
Accessible From Top Of PCB

MAINTENANCE

DISCONNECT TEST LEADS FROM EXTERNAL CIRCUIT BEFORE SERVICING TESTER

BATTERY TEST AND REPLACEMENT

Two batteries are used in the ohmmeter circuit. A 1.5V D cell (NEDA 13F) is used for the X1, X10, X100 and X1k ranges. If the pointer cannot be adjusted to zero on any of these ranges, with the test prods touched together, the 1.5 volt battery should be replaced.

A 30V (NEDA 210) battery is used on the X10k and X100k ranges. If the pointer cannot be adjusted to zero on these ranges the 30 volt battery should be replaced.

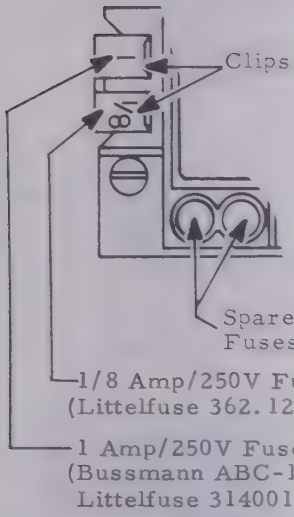
See General Instructions (page 8) for battery replacement procedure.

FUSE REPLACEMENT

Three fuses are included, two of which are accessible by removing the battery compartment cover and the third, which is a 2 Amp, 1000 volt fuse intended to blow only if the primary fuses arc over is accessible by removing the back cover.

CAUTION: USE ONLY SPECIFIED TYPE FUSES AND INSERT IN CORRECT FUSE HOLDER

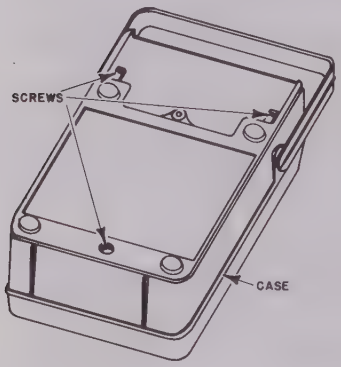
To replace 1/8 Amp or 1 Amp fuse:



1. Remove battery compartment cover (see General Instructions Page 8).
2. Slide clip towards edge of case until the fuse releases. Pull fuse out.
3. Holding clip towards edge, insert replacement fuse.

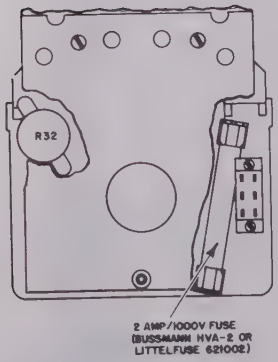
4. Press fuse down until clip springs back over fuse (use probe to assist, if desired).
5. Replace battery compartment cover.

To replace 2 Amp (1000V) fuse:



1. Remove battery compartment cover (see General Instructions page 8).

2. Remove three screws containing case. Remove case.



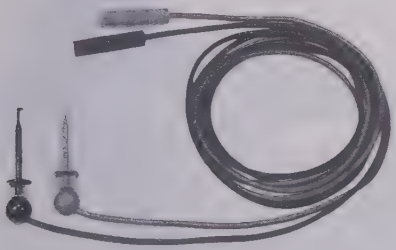
3. Locate fuse, remove and replace.

4. Replace case and battery cover.

ACCESSORIES

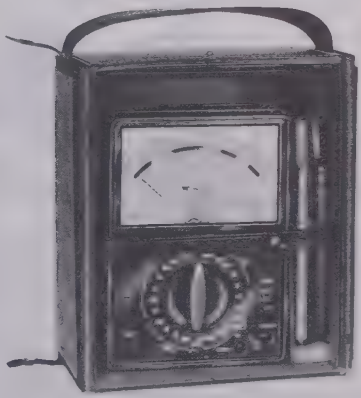
The usefulness and range of the VOM can be extended by the use of the following accessories:

1. Miniature Clip For High Density Circuits



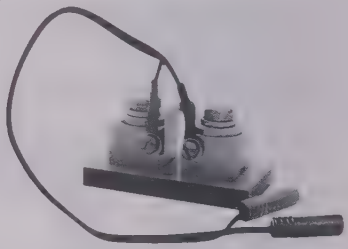
Part No.
79-373

2. Leather Case



Part No.
10-2739

3. DC Current Shunts

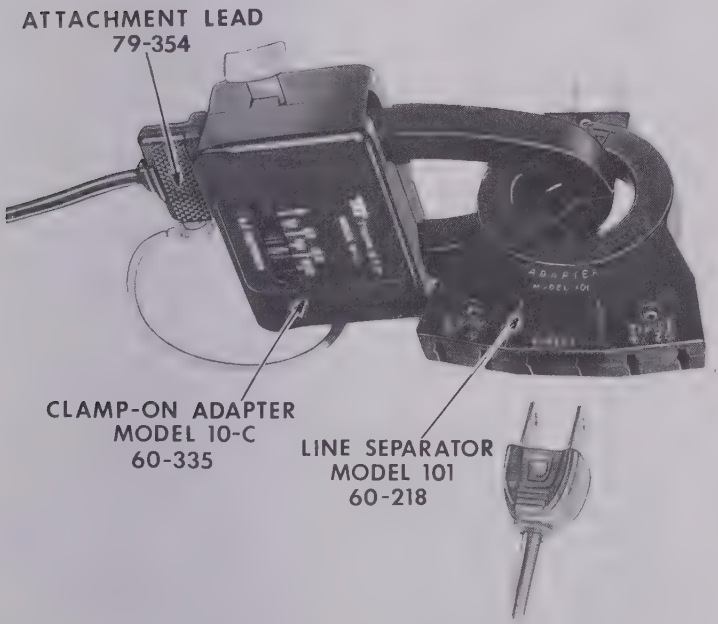


Part No.	To Read	Set Switches		Read On Scale	Multiply By
		Range	Multi		
91-635	15 Amp	.05 DCmA	VOM	0-15 DC	Direct
	30 Amp	.05 DCmA	x2	0-30 DC	Direct
91-636	50 Amp	.05 DCmA	VOM	0-5 DC	x10
	100 Amp	.05 DCmA	x2	0-10 DC	x10

4. High Voltage Probes

Part No.	To Read	Set Switches		Read On Scale	Multiply By
		Range	Multi		
79-380	15 kVDC	15 VDC	VOM	15 VDC	1000
	30 kVDC	15 VDC	x2	30 VDC	1000
79-381	15 kVAC	15 VAC	VOM	15 VAC	1000
	30 kVAC	15 VAC	x2	30 VAC	1000

5. AC Current Measuring Accessories



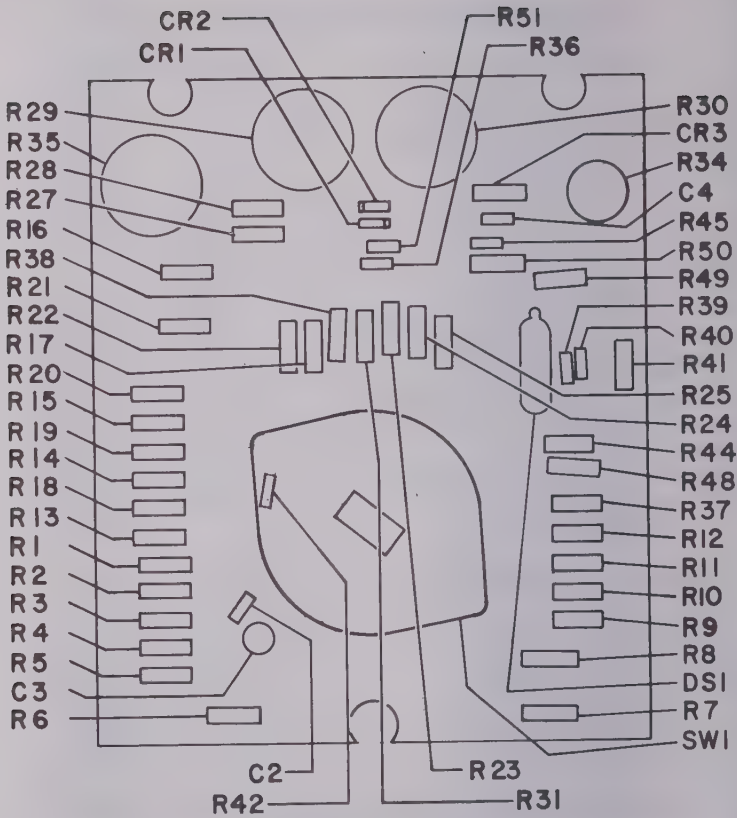
Replaceable Parts Model 60-NA

Description	Ref. No.	Part No.
Battery 1.5V (NEDA 13F)	B1	2426-1
Battery 30V (NEDA 210)	B2	37-19
Fuse, 1 Amp/250V (Bussmann ABC-1), (Littelfuse 314001 3AB)	F1	3207-58
Fuse, 1/8 Amp/250V (Littelfuse 362.125 8AG)	F2	3207-45
Fuse, 2A/1000V (Bussmann HVA-2) (Littelfuse 621002)	F3	3207-60
Meter Assembly		52-6186
Meter Front w/Window		10-2733
PC Board w/Components		87-440
Diode *	CR1, 2	11056
Diode	CR3	11670
Resistor, 2.7Ω W.W.	R18	15-5647
Resistor, 27.1Ω W.W.	R19	15-5650
Resistor, 276Ω W.W.	R20	15-5651
Resistor, 3.24k Prec.	R21	15K-3241UC5
Resistor, 1.37k Prec.	R22	15K-1371UC5
Resistor, 3.00Ω W.W.	R23	15-5652
Resistor, 30.3Ω W.W.	R24	15-5653
Resistor, 333Ω W.W.	R25	15-5654
Resistor, Variable 5k	R29	16-193
Resistor, Variable 5k	R30	16-193
Resistor, Variable 15k	R32	16-292
Resistor, Variable 50k	R34	16-277
Resistor, Variable 750Ω W.W.	R35	16-286
Resistor, .300Ω W.W.	R39	15-5655
Lamp, Neon	DS1	67-98
Switch, Rotary	SW1	22-691

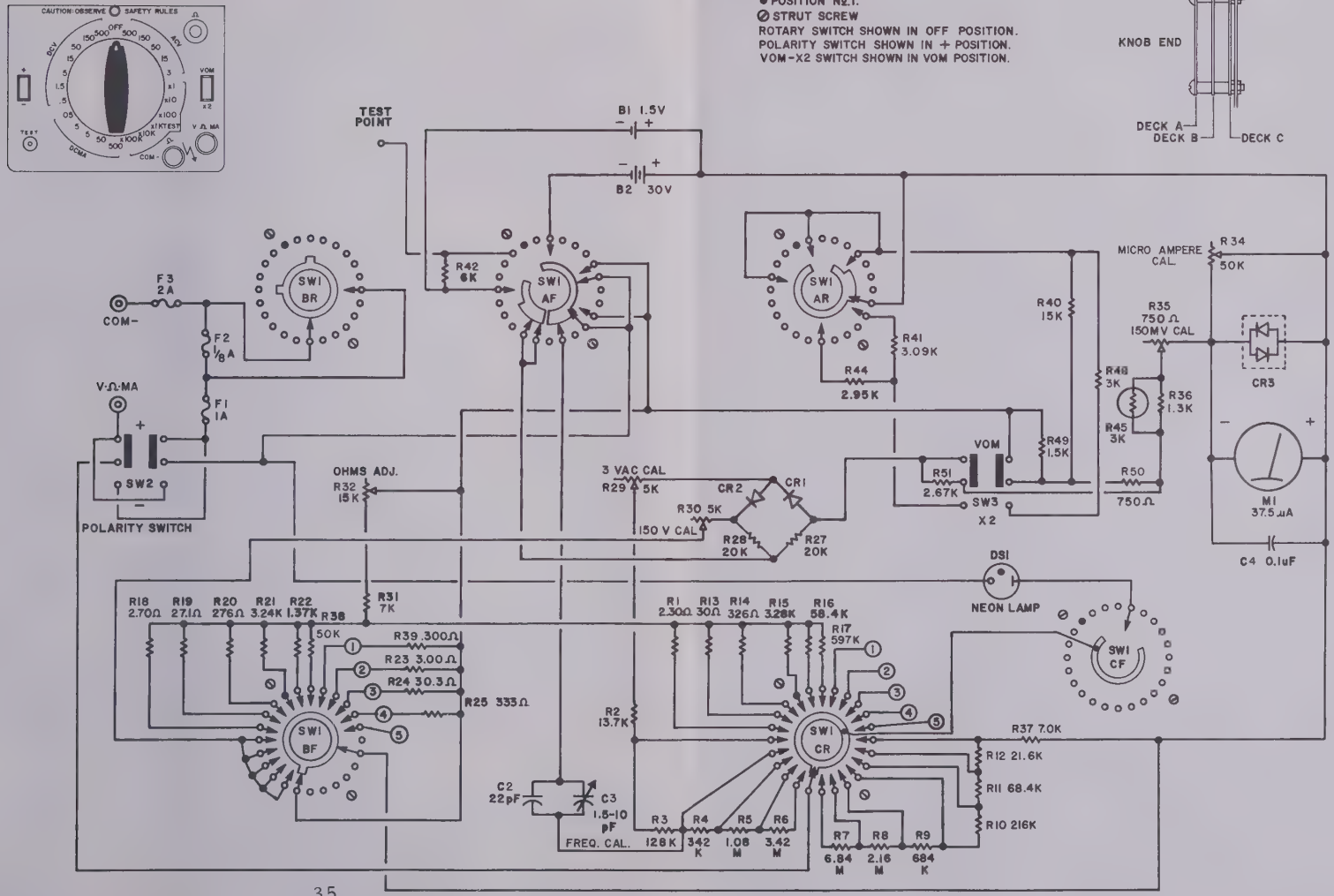
Replaceable Parts Model 60-NA (cont'd.)

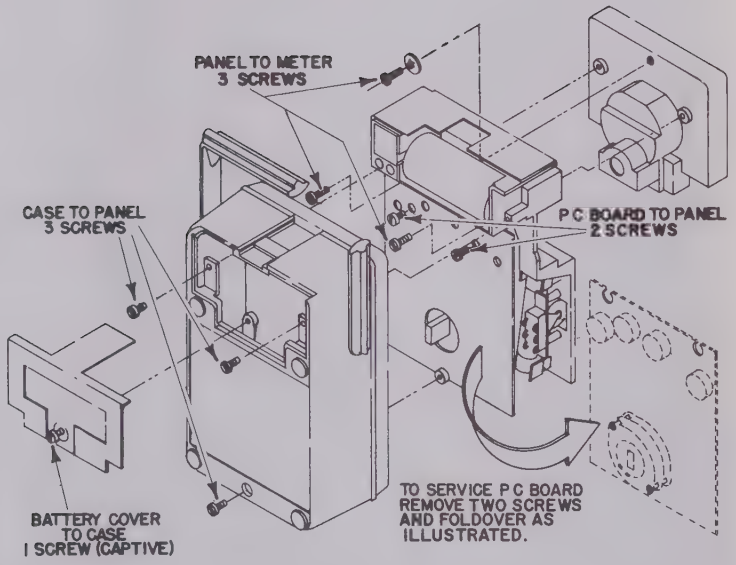
Description	Ref. No.	Part No.
Shaft for Switch, Rotary		61-210
Polarity Reversal Switch	SW2	22-661
Multiplier Switch	SW3	22-661
Battery Terminal, 1 1/2V, 30V		46-156
Fuse Clip		2451-122
Mainframe/Battery Compartment Assy.		28-1148
Printed Panel w/Hardware		28-1169
Knob, Rotary Switch		34-167
Knob, Ω Adjust		34-164
Fuse Clip Back-up Spring		42-289
Coil Spring, Fuse		42-278
Case Assembly w/Handle		10-2815
Handle w/Hardware		3206-59
Rubber Feet		98-49
Battery Compartment Cover		10-2817
Test Leads Package		79-374
Red Test Lead		79-368
Black Test Lead		79-369
Red Alligator		12352
Black Alligator		12353

* If CR1 or CR2 is replaced, recalibration of AC Volts is required.



Parts Location (Circuit Board)


DECKS VIEWED FROM KNOB END OF SWITCH.
● POSITION NO.1.
⊘ STRUT SCREW
ROTARY SWITCH SHOWN IN OFF POSITION.
POLARITY SWITCH SHOWN IN + POSITION.
VOM-X2 SWITCH SHOWN IN VOM POSITION.
KNOB END
DECK A
DECK B
DECK C
CAUTION: OBSERVE SAFETY RULES
TEST POINT
B1 1.5V
B2 30V
F3 2A
F2 1/8A
F1 1A
COM-
V·Ω·MA
SW2
POLARITY SWITCH
SW1 BR
SW1 AF
SW1 AR
SW1 BF
SW1 CR
SW1 CF
R42 6K
R41 3.09K
R44 2.95K
R40 15K
R49 1.5K
R51 2.67K
SW3 X2
VOM
OHMS ADJ.
R32 15K
3 VAC CAL
R29 5K
150 V CAL
R30 5K
R28 20K
CR1
CR2
R27 20K
MICRO AMPERE CAL.
R34 50K
R35 750Ω 150MV CAL
R48 3K
R36 1.3K
R45 3K
R50 750Ω
CR3
M1 37.5μA
C4 0.1uF
DS1
NEON LAMP
R18 2.70Ω
R19 27.1Ω
R20 276Ω
R21 3.24K
R22 1.37K
R38 50K
R31 7K
R39 300Ω
R23 3.00Ω
R24 30.3Ω
R25 333Ω
R1 2.30Ω
R13 30Ω
R14 326Ω
R15 3.28K
R16 58.4K
R17 597K
R2 13.7K
R37 7.0K
R12 21.6K
R11 68.4K
R10 216K
C2 22pF
C3 1.5-10 pF
FREQ. CAL.
R3 128K
R4 342 K
R5 1.08 M
R6 3.42 M
R7 6.84 M
R8 2.16 M
R9 684 K



Disassembly Instructions

WARRANTY

The Triplett Corporation warrants instruments manufactured by it to be free from defective material or factory workmanship and agrees to repair or replace such instruments which, under normal use and service, disclose the defect to be the fault of our manufacturing. Our obligation under this warranty is limited to repairing or replacing any instrument or test equipment which proves to be defective, when returned to us transportation prepaid, within one (1) year from the date of original purchase.

This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons or service stations in any way so as, in our judgment to injure their stability or reliability or which have been subject to misuse, negligence or accident or which have had the serial number altered, effaced, or removed. Neither does this warranty apply to any of our products, which have been connected, installed, or adjusted otherwise than in accordance with the instructions furnished by us. Accessories including batteries not of our manufacture used with this product are not covered by this warranty.

The Triplett Corporation reserves the right to discontinue models at any time, or change specifications, price or design, without notice and without incurring any obligation.

Upon acceptance of this material the purchaser agrees to assume all liability for any damages, and bodily injury which may result from the use or misuse of the material by the purchaser, his employees, or others and that the Triplett Corporation shall incur no liability for direct or consequential damage of any kind.

Parts will be made available for a maximum period of five (5) years after the manufacture of this equipment has been discontinued. Parts include all materials, charts, instructions, diagrams, accessories, et cetera, which were furnished in the standard or special models.

This warranty and conditions of sale are in lieu of all others expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products.

Printed in U.S.A. Part No. 84-284A

For Fast Reliable Service on Triplett Products, Contact the Triplett Factory or One of the Following

TRIPLETT SALES AND SERVICE MODIFICATION CENTERS

WARRANTY REPAIRS

Name	Address	Telephone
Brooks Electronics Service Co.,	3761 West 95th St., Overland Park, Kansas 66207	913 648-3131
CAM/RPC Electronics,	620 Alpha Drive, Pittsburgh, Pennsylvania 15238	412 288-2372
Croft-Weatherford Instrument Div., Western Electr. Supply Co.,	640 Allen Ave., Glendale, Ca. 91201	213 246-4861
Dynametron,	3343 Edwards Avenue, Santa Clara, California 95050	408 246-6535
E. I. L. Instruments, Inc.,	1844 Ardmore Blvd., Pittsburgh, Pennsylvania 15221	412 731-5230
E. I. L. Instruments, Inc.,	1520 West Rosecrans Ave., Gardena, California 90249	213 321-5891
E. I. L. Instruments, Inc.,	1830 York Road, Timonium, Maryland 21093	301 252-1260
Eicher-Richards Company,	2727 N.E. Blakeley St., Seattle, Washington 98103	206 523-7888
Electro-Mechano Company,	241 East Erie Street, Milwaukee, Wisconsin 53202	414 272-4050
Hosica Labs.,	715 Main Street, North Caldwell, New Jersey 07006	210 256-7724
I. T. R. Instrument Technical Representatives,	1425 Blue Jay Lane, Richmond, Virginia 23229	804 288-7198
Industrial Instrument Works,	134 Laitram Lane, Harahan, Louisiana 70123	504 733-8355
Industrial Service Lab.,	4354 Olive, St. Louis, Missouri 63108	314 535-5760
Instrument & Control Div., Brownell-Electro, Inc.,	307 27th St., Orlando, Florida 32806	305 843-6775
Instrument & Control Div., Brownell-Electro, Inc.,	P.O. Drawer 82730, Atlanta, Georgia 30354	404 762-5181
Instrument & Control Div., Brownell-Electro, Inc.,	P.O. Box 16368, Charlotte, N. C. 28216	704 394-4341
Instrument & Control Div., Brownell- Electro, Inc.,	3053 Tranquility Dr., Box 161074, Memphis, Tenn. 38116	901 332-9254
Instrument Control Company,	2401 East Franklin, Minneapolis, Minnesota 55406	612 336-7744
Kems, Inc.,	239 Puuhale Road, Honolulu, Hawaii 96819	808 847-1395
Kimball Electronic Laboratory, Inc.,	3620 N.E. 48th Terrace, Miami, Florida 33142	305 635-9712
Mancib Company, The,	Middlesex Turnpike at "A" St., Burlington, Massachusetts 01803	617 272-9450
Mancib Company, The,	P.O. Box 781, Randolph Rd., Coe Ave., Middletown, Connecticut 06457	203 346-6646
Meter-Makers, Inc.,	2450A Lunt Avenue, Elk Grove Village, Illinois 60007	312 439-5050
Metermaster Instrument Corp.,	1165 South Cherokee St., Denver, Colorado 80223	303 722-5766
Metermaster Div., Kierulff Electronics, Inc.,	5646 Jillson St., Los Angeles, California 90040	213 685-4340
Metermaster Div., Kierulff Electronics, Inc.,	3995 E. Bayshore Rd., Palo Alto, California 94303	415 968-0313
Metermaster Div., Kierulff Electronics, Inc.,	121 Gordon St., Elk Grove Village, Illinois 60007	312 593-8650
Metermaster Div., Kierulff Electronics, Inc.,	2633 E. Buckeye Rd., Phoenix, Arizona 85034	602 244-9441
Metermaster,	2809 National Drive, Garland, Texas 75041	214 271-5671
Metermod Instrument Corp.,	48-15 31st Avenue, Long Island City, New York 11103	212 726-4850
Meters & Instruments Corp.,	6502 Gulf Freeway, Houston, Texas 77023	713 644-1631
Pacific Indicator Company,	6603 West North Avenue, Oak Park, Illinois 60302	312 261-1330
Pioneer/Instrumentation, Div. of Pioneer-Std. Electronics, Inc.,	4800 East 131st St., Cleveland, Ohio 44105	216 587-3600
Pioneer/Dayton,	1900 Troy Street, Dayton, Ohio 45404	513 236-9900
Pyttronic Industries, Inc.,	Balto-Wash Industrial Center, 8220 Wellmoor Court, Savage, Maryland 20863	301 953-3000
Quality Instrument Labs.,	4832 Caroline, Houston, Texas 77004	713 524-0528
Ram Meter, Inc.,	1100 Hilton Road, Ferndale, Michigan 48220	313 398-6767
Schmidt Electronics,	122 East Napa Street, Sonoma, California 95476	707 938-8416
Straughn Electronics, Inc.,	P.O. Box 6024, 3235 Highland Ave., Beaumont, Texas 77705	713 838-4563
Sunshine Scientific Instruments, Inc.,	5800 Main Street, Elkridge, Maryland 21227	301 796-5600
Sunshine Scientific Instruments, Inc.,	1810 Grant Avenue, Philadelphia, Pennsylvania 19115	215 673-5600
Tri-State Instrument Lab.,	6801 E. 15th Street, Tulsa, Oklahoma 74112	918 838-8883
Trott Electronics, Inc.,	9020 Wehrle, Clarence, New York 14031	716 634-8500
Ultra Instrument Labs.,	9995 Monroe Drive, Dallas, Texas 75220	214 357-0297
Weschler Electric Corp.,	4250 West 130th Street, Cleveland, Ohio 44135	216 251-4609
Whitlock Instrument Repair,	1306 North Texas, Odessa, Texas 79760	915 337-3412
Electro Meters Co., Ltd.,	705 Progress Avenue, Scarborough, Ontario M1H 2X1	416 438-6555
Metermaster, Div. of R. H. Nichols Co., Ltd.,	214 Dalomite Drive, Downsview, Ontario, Canada M3J 2P8	416 661-3190
Triplett Corp.,	286 Harmon Road, Bluffton, Ohio 45817	419 358-5015

Triplett Mod Centers

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Postage Will Be Paid by:

TRIPLETT CORPORATION

BLUFFTON, OHIO 45817

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FIRST CLASS

PERMIT NO. 41

Bluffton, Ohio

WARRANTY REGISTRATION CARD

COMPLETE THIS CARD AND RETURN TO TRIPLETT CORP. WITHIN 10 DAYS TO VALIDATE YOUR WARRANTY

60-NA (3151)

Instrument Model Number **Date of Purchase**

Purchaser's Name

Title

Purchaser's Company

Address

City **State** **Zip**

1. Purchaser's business at this location is: (check only one, please)

MANUFACTURING
- A. ☐ Electrical Construction
- B. ☐ Fabricated Metal Products (except Ordnance, Machinery & Transportation Equipment)
- C ☐ Machinery (except electrical)
- D. ☐ Computers or Computer Peripheral Equipment
- E. ☐ Communication Equipment
- F ☐ Consumer Electronic Equipment
- G. ☐ Electronic Components
- H. ☐ Electrical Machinery
- I. ☐ Transportation Equipment
- J. ☐ Professional & Scientific Instruments, Photographic & Optical Goods, Watches & Clocks

UTILITIES
- K. ☐ Transportation Systems
- L. ☐ Communication Systems
- M. ☐ Electric, Gas & Other Utility Services

SERVICE
- N. ☐ Radio & TV Service
- O. ☐ Home Appliance Service
- P. ☐ Business Machine Service
- Q. ☐ Medicine
- R. ☐ Education
- S. ☐ Consultant
- T. ☐ Hobby
- U. ☐ Other (please specify)

2. The Instruments principal use will be in: (check only one, please)
- A. ☐ Research &/or Development Labs
- B. ☐ Electrical Maintenance
- C ☐ Electronic Maintenance
- D ☐ Quality Control
- E. ☐ Production
- F. ☐ Classroom

3. Participants in the selection of this Instrument were: (check more than one if necessary)
- A. ☐ General Management
- B. ☐ Department Management
- C ☐ Project Management
- D ☐ User's Supervisor
- E. ☐ User
- F. ☐ Purchasing

4. This model was selected because of its: (check more than one if necessary)
- A. ☐ Accuracy
- B. ☐ Reliability
- C. ☐ Triplett's Reputation
- D. ☐ Voltage Ranges
- E. ☐ Current Ranges
- F. ☐ Resistance Ranges
- G. ☐ Advertisements
- H. ☐ Features

5. Is this your first Triplett Tester?
- A. ☐ Yes
- B. ☐ No

6. What other type of test equipment would you like to see Triplett make?

_____

_____

_____

_____

Triplett Corporation Bluffton, Ohio 45817